Progress Report on Tsunami Detector System

As of October 14, 1997, two deep ocean tsunami detection systems have been deployed and are operating in the North Pacific. A summary of the development, construction, and field activities follows:

- Completed the main CPU board based on a Motorola 68332 microprocessor that is used in the new tsunami sensor and on the surface buoy. Designed a PCMCIA board and interface electronics that will be the mass storage unit for the new tsunami sensor. The board uses a 40 MB Intel flash memory PC card, which will replace the hard disk drives used in the earlier versions of the sensor. The counter board for the PAROS sensor has been redesigned to operate with very low power for long-term deployments.

- GOES transmitters were thoroughly tested on self-timed and random reporting modes. All transmissions were received and the delay of message through the NESDIS dial-up modem was always less than 1 minute.

- A test of the acoustic modems was completed during the week of March 10, 1987, in Puget Sound, followed by a test from the RV *MOANA WAVE* near Hawaii on March 24-25, 1997. Modem transmit power was increased by 10 dB as a result of these tests.

- Software to detect a tsunami and make the appropriate response was developed and installed in the tsunami sensor. A combination of random reports and modified self-timed transmissions has been developed for the tsunami response. The complex timing and protocol issues associated with the acoustic modem and GOES transmitters were defined and extensively tested.

- Two 2.5 m disc buoys, including towers, bridles, internal metalwork, instrument wells, ballast weights and the entire mooring systems were designed and fabricated. The design was based around the requirements to endure the North Pacific winter storms, yet maintain a tight watch circle over the BPR moorings.

- Two complete systems were shipped to Dutch Harbor, AK, and loaded on the *RV WECOMA*. One system was deployed at 51 32N, 151 23.9W in 4600 meters of water on July 18, 1997. The buoy failed to bring data back through the satellite, but weather precluded any further work at that time. The effort consumed all available parts and spares so the second system was returned to PMEL.

- On September 15, 1997, the second buoy was successfully deployed from the NOAA Ship *RONALD H. BROWN* approximately 140 NM west of Newport, Oregon, in 2600 m of water. The buoy has reliably reported data since deployment.

- The northern buoy was recovered, repaired and redeployed from the MV REDEEMER, a 130' salvage tug, on October 10, 1997. The system has worked perfectly since redeployment.

- A Web page was developed to take data from the GOES dial-up modem and display it in near real-time. Installation of Direct Readout Ground Stations installations at the Warning Centers and PMEL is being considered to enhance the warning capability of the system.